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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/524,339	07/18/2005	Curt Harkless	086089-9085-00	6946

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EXAMINER

REDDING, THOMAS M

ART UNIT

PAPER NUMBER

2624

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DELIVERY MODE

04/23/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/524,339

Applicant(s)

HARKLESS ET AL.

Examiner

THOMAS M. REDDING

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF 298)
Paper No(s)/Mail Date 2/11/2005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 6, 8, 9, 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grasselli (Cited by applicant in IDS).

Regarding claim 1, Grasselli teaches [a] method of obtaining a representation of an image (Grasselli, figure 11), comprising:

sub-dividing said image into a plurality of cellular regions ("The picture is subdivided into a certain number of squares, called samples", Grasselli, page 255, paragraph 4, and figures 12 and 13);

for each cellular region:

comparing image information of said each cellular region to a plurality of said cellular region representations ("For each sample, the "predominant" slope of the ridge segments in the picture is determined, and digitized in one of eight possible values", Grasselli, page 255, paragraph 4); and based on said comparison, selecting one of said set of cellular region representations to represent said each cellular region ("For each sample,

the "predominant" slope of the ridge segments in the picture is determined, and digitized in one of eight possible values", Grasselli, page 255, paragraph 4).

Grasselli does not explicitly teach providing and comparing to a stored set of cellular region representations.

Grasselli does teach the concept of having a set of predetermined representative states ("For each sample, the "predominant" slope of the ridge segments in the picture is determined, and digitized in one of eight possible values", Grasselli, page 255, paragraph 4 and diagram at the bottom of figure 13) .

It would have been obvious to one of ordinary skill in the art at the time the invention was made that the eight possible slope values of Grasselli is analogous to the cellular region representations of the applicant and serve the same purpose of mapping cellular regions to a more general characteristic description.

Regarding claim 2, Grasselli teaches wherein each cellular region representation of said set of cellular region representations comprises pattern information and wherein said image information of said each cellular region comprises pattern information ("For each sample, the "predominant" slope of the ridge segments in the picture is

determined, and digitized in one of eight possible values", Grasselli, page 255, paragraph 4, The slope disclosed by Grasselli is pattern information).

Regarding claim 3, wherein each cellular region representation of said set of cellular region representations comprises a set of values for a parameter set and wherein said image information of said each cellular region comprises a set of values for said parameter set ("For each sample, the "predominant" slope of the ridge segments in the picture is determined, and digitized in one of eight possible values", Grasselli, page 255, paragraph 4, and figure 13) The slope disclosed by Grasselli is pattern information and is used as a descriptive parameter).

Regarding claim 6, Grasselli teaches wherein said each cellular region representation has a set of values for said parameter set different from that of all other cellular region representations of said set of cellular region representations ("For each sample, the "predominant" slope of the ridge segments in the picture is determined, and digitized in one of eight possible values", Grasselli, page 255, paragraph 4, and figure 13, Grasselli's 8 possible value are 8 different angles, there is no duplication)

Regarding claim 8, Grasselli teaches further comprising storing each selected one of said set of cellular region representations in order to store a representation of said image (Grasselli, figure 13, each cell is mapped to a parameter corresponding to a representative slope).

Regarding claim 9, Grasselli teaches wherein each of said cellular regions has identical spatial dimensions (Grasselli, figure 12, Grasselli uses a regular grid pattern of square samples that are all the same size).

Regarding claim 11, Grasselli teaches wherein said image comprises a biometric ("Fingerprints seem to offer an almost ideal ground for trying out linguistically-oriented method", Grasselli, page 255, paragraph 2, Grasselli is working in fingerprint analysis which is a biometric).

Regarding claim 12, Grasselli teaches wherein said biometric is a fingerprint ("Fingerprints seem to offer an almost ideal ground for trying out linguistically-oriented method", Grasselli, page 255, paragraph 2, Grasselli is working in fingerprint analysis).

Regarding claims 13, Grasselli teaches the elements common with claim 1 above. Grasselli further teaches a computer on which to implement the method. ("The scanner is coupled through a PDP-8 computer to the (medium size) computer CEP", Grasselli, page 255, paragraph 1). In order for the method to be operable on Grasselli's computer, it must be stored as a program on a computer readable medium.

Regarding claim 14, Grasselli teaches all the elements common with claim 1 above. Grasselli further teaches an apparatus on which to implement the method ("it consists of a random-access flying spot scanner for 24 x 36 mm. negatives; the scanner digitizes the picture in an array of 512 x 512 points, in 8 grey levels. The scanner is coupled through a PDP-8 computer to the (medium size) computer CEP", Grasselli, page 255, paragraph 1).

Regarding claim 15, Grasselli teaches [a] method of obtaining a representation of an image (Grasselli, figure 11), comprising:

sub-dividing said image into a plurality of cellular regions ("The picture is subdivided into a certain number of squares, called samples", Grasselli, page 255, paragraph 4, and figures 12 and 13);

for each cellular region:

obtaining a cellular region set of values for said parameter set for said each cellular region and comparing said cellular region set of values to each said cellular region representations ("For each sample, the "predominant" slope of the ridge segments in the picture is determined, and digitized in one of eight possible values", Grasselli, page 255, paragraph 4); and,

based on said comparison, selecting one of said set of cellular region representations to represent said each cellular region.

Grasselli does not explicitly teach providing a stored set of cellular region representations, each cellular region representation comprising a set of values for a parameter set.

Grasselli does teach the concept of having a set of predetermined representative states ("For each sample, the "predominant" slope of the ridge segments in the picture is determined, and digitized in one of eight possible values", Grasselli, page 255, paragraph 4 and diagram at the bottom of figure 13) .

It would have been obvious to one of ordinary skill in the art at the time the invention was made that the eight possible slope values of Grasselli is analogous to the cellular region representations of the applicant and serve the same purpose of mapping cellular regions to a more general characteristic description, and in particular mapping to parameters.

3. Claims 4, 5, 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grasselli (from IDS) in combination with Ort et al. (US 5,926,555 - cited by applicant in IDS).

Regarding claim 4, Grasselli teaches all the elements of claim 1 as given above.

Grasselli does not teach wherein said each cellular region representation is defined as a cosinusoidal pattern.

Ort, working in the same field of endeavor of fingerprint analysis does teach wherein said each cellular region representation is defined as a cosinusoidal pattern ("The smoothed Ridge Angle and Ridge Frequency Maps are later converted to coarser maps, denoted herein as final maps, that are stored in the Products File 50", Ort, column 18, line 33).

It would have been obvious at the time the invention was made for one of ordinary skill in the art to use the Fourier based analysis method of Ort with the fingerprint analysis system of Grasselli since "many of the features extracted by the Advanced Encoder are familiar ones in fingerprint science. These features are: minutiae (location and direction); Ridge Angle and Ridge Frequency Maps; cores and deltas. Introducing measurement of quality, detecting and recording non minutiae areas and applying the quality knowledge to mathematical operations and decision processes increases selectivity in the Minutia Matcher component of the system. Knowledge of non-minutiae areas is recognized and used by examiners but is not part of prior art automated systems operations", (Ort, column 7, line 54).

Regarding claim 5, the combination of Grasselli and Ort teaches wherein said parameter set comprises parameters of ridge angle, ridge spacing and phase offset

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(Ort, figure 6, Ridge Angle Map - 135, Ridge Frequency Map – 175, and “The important output of the Encoder 30, though, is the combination of the Gabor and Minutiae filtered images, because these filters, working as a pair, are designed to capture the phase discontinuity that occurs at a minutia”, Ort, column 19, line 11, and “In the present invention, a unique encoder (referenced as Advanced Encoder) scans a gray scale image of both search and file fingerprints to extract certain discriminating features, such as ridge angle, ridge frequency, the location of the cores, deltas, ridges and minutiae”, Ort, column 7, line 34).

Regarding claim 7, Grasselli teaches all the elements of claim 1 as given above.

Grasselli does not teach down-sampling said image to produce a down-sampled image prior to said sub-dividing.

Ort, working in the same field of endeavor of fingerprint analysis does teach down-sampling said image to produce a down-sampled image prior to said sub-dividing (“the full scale contrast enhanced image may be optionally down-sampled in block 130”, Ort, column 14, line 67).

It would have been obvious to one of ordinary skill at the time the invention was made to use the down sampling method of Ort with the fingerprint system of Grasselli "To conserve computational time in some parts of the system" (Ort, column 14, line 66).

Regarding claim 10, Grasselli teaches all the elements of claim 1 as given above.

Grasselli does not teach associating a quality parameter with one or more of said cellular regions.

Ort does teach associating a quality parameter with one or more of said cellular regions ("the image is examined to develop a pixel-by-pixel quality map to describe the quality of the image at all locations", Ort, column 9, line 21).

It would have been obvious at the time the invention was made for one of ordinary skill in the art to use the quality map of Ort with the fingerprint system of Grasselli as "Knowing the quality of features is a tremendous aid to decision processes" (Ort, column 8, line 21) and "The quality of an image can vary significantly over the fingerprint, but if properly measured on a pixel by pixel basis, the detection of key features of the print can be enhanced, and any areas of the image of low quality can be identified" (Ort, column 9, line 16).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS M. REDDING whose telephone number is (571)270-1579. The examiner can normally be reached on Mon - Fri 7:30 am - 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571) 272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/T. M. R./
Examiner, Art Unit 2624

/Vikkram Bali/
Supervisory Patent Examiner, Art Unit 2624